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## **Toxics Use Reduction Plan Update Guidance**



Massachusetts  
Department  
of  
ENVIRONMENTAL  
PROTECTION

*Developed in collaboration with:*  
Office of Technical Assistance  
Toxics Use Reduction Institute  
Executive Office of Environmental Affairs

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## Appendix A - Plan Summary Form and Guidance

## I. Introduction

The Toxics Use Reduction Act (TURA, MGL c. 21I) and its regulations at 310 CMR 50.00, establishes toxics use reduction as a central component in the Commonwealth's efforts to protect public health and the environment and to promote the competitive advantage of Massachusetts businesses through efficient materials use and management. TURA requires companies that use certain toxic materials in their operations above specific thresholds to file annual reports detailing their use of toxic materials, and to develop Toxics Use Reduction Plans that review toxics use and identify toxics use reduction opportunities. Because TUR planning is intended to be a continuous process, a Plan Update documenting progress is required every two years.<sup>1</sup>

The purpose of this document is to assist you in updating your Toxics Use Reduction (TUR) Plan and in preparing the Plan Summary, which must be mailed to the Department of Environmental Protection (DEP) by July 1, 2004. DEP requires plan updates to be completed only in even-numbered calendar years. Therefore, facilities that filed a toxics use report for 2002 and are required to file a report for 2003, must complete a TUR Plan Update by July 1, 2004. A good faith effort to identify and evaluate toxics use reduction (TUR) opportunities through the TUR planning process will benefit your facility by identifying opportunities to eliminate waste, cut costs, and achieve a cleaner, healthier workplace and environment. This Plan Update Guidance will help make the updating process easier for you and will provide the documentation necessary to have your Plan Certification Statement approved and signed by a TUR Planner.

**Plan Update Worksheet** - DEP recommends that you consider using the Plan Update Worksheet to guide you in updating your TUR Plan and documenting your update efforts. The creation of a TUR Plan in addition to your original Plan is **not** necessary to fulfill the requirement of preparing a Plan Update. A Plan Update only needs to update relevant sections of your existing Plan.

You could begin by using the Plan Update Worksheet as a screening tool to identify which sections of your existing TUR Plan need the most attention. A step-by-step review of each section of the Plan then can be performed and the Plan Update Worksheet can be used to help document the review and activities implemented during the past two years. The completed Plan Update Worksheet can be inserted into the table of contents section of your existing TUR Plan and can serve as the primary point-of-reference to document your efforts. The Plan Update Worksheet can reference the location of documents, the date that Plan requirements were updated, the people involved in update activities, and notations concerning your TUR progress or explanations of why TUR options were not selected or were not completed successfully.

**Plan Summary** - Facilities will continue to report two-year and five-year projections for their expected change in chemical use and byproduct generation. They will report the projected byproduct reduction index (BRI) for each chemical used in a production unit.

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<sup>1</sup> Under the following circumstances Plan Updates are not required: when a chemical has been eliminated, when a chemical is below the reporting threshold, or when a facility is scheduled to close. *For further information, please refer to Exceptions to Plan Requirements in Appendix A.*

An optional section of the Plan Summary Form allows facilities to provide additional information about their TUR Plan and/or progress. For example, you may choose to describe accomplishments, quantify savings, or provide additional information about improvements to workplace safety as a result of your TUR activities. Alternatively, this space can be used to explain why projected reductions in chemical use and byproduct generation made in the past were not met. It is intended that facilities will use this opportunity to communicate their progress to DEP.

This guidance document supplements the comprehensive 2002 Toxics Use Reduction Planning Guidance that is on DEP's web site at [www.mass.gov/dep/bwp/dhm/tura/turapubs.htm](http://www.mass.gov/dep/bwp/dhm/tura/turapubs.htm).

## **II. Getting Started**

The first step in developing the Plan Update is employee notification. Facilities should notify all employees by January 1, 2004 that the Plan Update process is underway and any teams or committees that previously worked on TUR planning should be reconvened. Facility management should reissue the facility's Management Policy on toxics use reduction to reinforce the goals of TUR planning.

The task of updating your facility's TUR Plan consists of going through each element of the Plan to evaluate its effectiveness, quantify progress, and determine if modifications would produce better results. Only you can define a successful TUR Plan. Consider using the Plan Update Worksheet on pages 6-12 to guide you in preparing your update. Challenge your TUR team during this Plan Update process. Many facilities have succeeded in improving their business and increasing their productivity through TUR planning.

The Plan Update must be signed by a certified TUR Planner. In addition, a senior management official must certify it as true, accurate, up-to-date, and complete. The standard of compliance is the same as for the original planning process: a good faith effort to identify and evaluate TUR options.

Keep in mind that, while implementation of TUR strategies is not mandated, you are required to make a good faith effort to plan for TUR and to explain if you did not meet your previously projected reductions in chemical use or byproduct generation. The Plan Summary Form allows you to explain why there may be differences in your previously projected and actual reductions in use or byproduct.

### **III. Features of this Guidance Document**

In addition to the Plan Update Worksheet, this guidance document describes each section of a TUR Plan and provides a brief summary of the requirements (For a more comprehensive discussion on Plan elements, see the 2002 Toxics Use Reduction Planning Guidance available on DEP's web site). The guidance poses a number of questions to ask yourself that will assist you in your evaluation and update. It is not necessary to include answers to these questions in the Plan Update, but you may find it useful in documenting your update activities. We strongly recommend that you use these questions to guide you when evaluating and documenting your TUR efforts. We also advise you to keep the information you collect on file (TURA requires documentation to be kept for 5 years) and make notations on the Plan Update Worksheet as to its location and the date of your last review. This will serve to document your Plan Update efforts and should be kept with your TUR Plan.

Best management practices are outlined in this guidance and examples of actual TUR success have been included to help you accurately characterize chemical use and byproduct generation. The best practice in process characterization for TUR Planners is from a report done for a U.S. Environmental Protection Agency grant project. The report is entitled, "Measuring Progress in Toxics Use Reduction and Pollution Prevention," and is the result of a combined effort on behalf of the Massachusetts TURA Program. This report develops and refines descriptions of the most advanced process characterization practices currently used by industry. (You may obtain a copy of this report by contacting the Toxics Use Reduction Institute at 978-934-3275.)

In addition to reductions in toxics use and byproducts, some facilities have documented significant cost savings, better materials tracking, decreased energy and water use, improved manufacturing efficiency, and product quality. TUR planning also has resulted in competitive advantage and improved management awareness of environmental issues. Some facilities have reduced the need for DEP permits and costly pollution control devices as a result of their TUR efforts, while others have used TUR planning as the foundation for environmental management systems and programs leading to better pollution prevention. Experience proves that TUR works.

Please note that if you need more information on compliance or regulatory requirements, you may call DEP at 617-292-5982. You also may call the Office of Technical Assistance for on-site technical assistance at 617-626-1060 or call the Toxics Use Reduction Institute at 978-934-3275 to obtain information on technical advances or information on technology or training programs.

## IV. Plan Update Worksheet Instructions

The purpose of the Plan Update is to ensure that every section of your original TUR Plan is current and up-to-date. Some sections of your Plan will change and others may not. The purpose of the Plan Update Worksheet is to make it easier for you to understand and complete the requirements of the Plan Update. The Plan Update Worksheet lists the **required** sections of the Plan in the boxed areas and allows you to document the date and location of the updated sections.

Use the *questions* listed under each section to indicate what has changed, what progress has been made, and what obstacles have been encountered. This is an opportunity for you to identify and document your good faith effort in updating your Plan.

The Plan Update Worksheet is optional and can be useful for facilities that do their own Plans to check their work. The Plan Update Worksheet can be placed in the front of the existing Plan, referencing the pages of each current section. This documentation will make the update process easier and also will aid you in the event of a DEP inspection.

Below are two examples of how facilities can use the Plan Update Worksheet. Both facilities satisfied the requirements of the Plan Update by reviewing the Management Policy. However, only one of the facilities found that it needed to change its Management Policy. Each documented their progress in the space supplied.

(Example 1)

### ***Sample Use of Plan Update Worksheet Management Policy Section: Facility 1***

Action Item	Date Reviewed*	Date Revised
Management Policy has been reviewed and revised as needed.	2/2/2004	3/2/2004
Management Policy is located at:	Page 2a of Original Plan	

**Narrative Section** (You may use this section to comment on such questions as: How has the Management Policy been refined over the past two years? How has the Management Policy been communicated to employees? Has the Policy resulted in greater employee awareness or increased implementation of TUR? If so, how?)

*The Management Policy has changed since the last update. At the time the original Management Policy was written we did not fully realize the benefits of materials accounting. After implementing the original Management Policy we realized that materials accounting was not just an exercise - it saved us money in raw materials and waste disposal. We changed the new Management Policy to require materials accounting for all processes, not just those involving toxics. The new version of the Policy was inserted after the old version in the original Plan.*

(Example 2)

*Sample Use of Plan Worksheet Management Policy Section: Facility 2*

Action Item	Date Reviewed*	Date Revised
Management Policy has been reviewed and revised as needed.	2/2/2004	See note Below
Management Policy is located at:	Page 2 of Original Plan	

**Narrative Section** (You may use this section to comment on such questions as: How has the Management Policy been refined over the past two years? How has the Management Policy been communicated to employees? Has the Policy resulted in greater employee awareness or increased implementation of TUR? If so, how?)

*The Management Policy was reviewed and it was determined that while the Policy accurately represented top management's attitude toward TUR, the Policy had not been supported through middle management, and therefore did not reach the workers. Although the Policy did not require a change, it was determined that it could be communicated more effectively. Since the Policy was reviewed, more efforts have been made to communicate the Policy through middle management. The Policy has been posted, sent by E-mail, and discussed at weekly meetings. The Policy has been useful in marketing the facility as environmentally responsible.*

The Plan worksheet is presented on pages 6-12. Descriptions of each Plan element begin on page 13.

## PLAN UPDATE WORKSHEET

2004 TUR TEAM MEMBERS			
Name	Title	Name	Title

### FACILITY-WIDE COMPONENTS OF THE PLAN

#### A. MANAGEMENT POLICY

Action Item	Date Reviewed	Date Revised
Management Policy has been reviewed and revised as needed.		
<b>Management Policy is located at:</b>		

**Narrative Section** (You may use this section to comment on such questions as: How has the Management Policy been refined over the past two years? How has the Management Policy been communicated to employees? Has the Policy resulted in greater employee awareness or increased implementation of TUR? If so, how?)



## PLAN UPDATE WORKSHEET

### B. SCOPE OF PLAN

Action Item (Review the following items to determine if they are accurate and up-to-date. Revise as needed.)	Date Reviewed	Date Revised
<b>Production Unit Descriptions</b> (Include the identifying #, the processes, chemicals and products involved with the units.)		
<b>Summary of Process</b> used to identify TUR Options.		
<b>TUR Options Rejected</b> (Include a description of those options and an explanation of why they were not chosen.)		
<b>TUR Options Chosen</b> (Include a description of the option, anticipated costs and savings, expected reductions, and an implementation schedule.)		
<b>2 and 5 Year Projections</b> for total use and byproduct for each chemical (projected to 2005 and 2008).		
<b>The Scope of Plan is located at:</b>		

**Narrative Section** (You may use this section to discuss any changes in your Scope of Plan.)

## PLAN UPDATE WORKSHEET

### C. EMPLOYEE NOTIFICATION

Action Item	Date Completed	Location of Documentation
Employee notification has been completed.		

**Narrative Section** (You may use this section to discuss whether or not the employee notification generated interest, participation, and TUR options.)

### D. PROCESS CHARACTERIZATION

Action Item (Review the following items to determine if they are accurate and up-to-date. Revise as needed.)	Date Reviewed	Date Revised
<b>Production Unit Descriptions</b> (Include the identifying #'s and the unit of product.)		
<b>Purpose of Chemicals</b> (Include a statement of the purpose each chemical serves in the production units.)		

## PLAN UPDATE WORKSHEET

### D. PROCESS CHARACTERIZATION (continued)

Action Item (Review the following items to determine if they are accurate and up-to-date. Revise as needed.)	Date Reviewed	Date Revised
<b>Process Flow Diagram</b> for each production unit or combination of production units.		
<b>Materials Accounting</b> (For each production unit, identify and quantify 2003 total inputs and outputs of each chemical, including chemical use, byproducts and emissions.)		
<b>2 and 5 Year Projections</b> of total use and byproduct for each chemical in each production unit (projected to 2005 and 2008).		
<b>The Process Characterization Section is located at:</b>		

**Narrative Section** (You may use this section to note any changes in the production units, process flow diagrams, and chemical use that have occurred since the last Plan or Plan Update.)

## PLAN UPDATE WORKSHEET

### E.1 OPTIONS IDENTIFICATION

Action Item	Date Completed	Location of Documentation
A review to identify any new TUR options has been conducted.		

<b>Narrative Section</b> (What new TUR options, if any, were identified?)
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### E.2 and E.3 OPTIONS EVALUATION AND ECONOMIC EVALUATION

Action Item (Document the results of your options identification process)	Date Completed	Location of Documentation
<b>No New TUR Options were identified</b> (If no new options were found, identify any changes in the cost of using the toxic chemicals that may have occurred since the last plan review.)		
<b>New TUR Options were identified</b> (Evaluate the technical and economic feasibility of any newly-identified TUR options.)		
<b>Previously Rejected TUR Options were re-evaluated</b> (Re-evaluate the technical and economic feasibility of options rejected during the last planning cycle.)		

## PLAN UPDATE WORKSHEET

### E.2 and E.3 OPTIONS EVALUATION AND ECONOMIC EVALUATION (continued)

**Narrative Section** (Were any TUR options identified as clearly technically or economically infeasible? If so, describe them. Have all direct and indirect costs listed on pages 25-27 been considered for inclusion in your financial analysis of TUR options?)

### E.4 OPTIONS IMPLEMENTATION

Action Item	Date Completed	Location of Documentation
<b>New Implementation Schedule was developed</b> (If any new TUR options have been identified, develop an implementation schedule for those options.)		
<b>Prior Implementation Schedule was revised</b> (If facility developed an implementation schedule as part of the last Plan or Plan Update cycle, review the schedule to determine if the schedule was met and options implemented. Include an explanation for any lack of success.)		

## PLAN UPDATE WORKSHEET

### E.4 OPTIONS IMPLEMENTATION (continued)

**Narrative Section:** (Explain success or lack of success in implementing TUR options and meeting stated implementation schedule.)

### F. CERTIFICATION STATEMENT

Action Item	Date Completed	Location of Documentation
<b>Certification Statement signed by a TUR Planner and Senior Management Official.</b> (Original must be included in the Plan Summary and mailed to DEP.)		

### G. PLAN SUMMARY FORM

Action Item	Date Completed	Location of Documentation
<b>Plan Summary Forms</b> for each chemical have been changed. (Forms must be included in the Plan Summary and mailed to DEP.)		

**Narrative Section:** (Has the optional section of the Plan Summary been used to communicate your facility's TUR and environmental efforts/successes?)

## V. Plan Update Contents

The following describes each Plan element, circumstances under which each section of the Plan would need to be updated, and includes questions to consider that may prompt revisions to improve the Plan's effectiveness, implementation and your TUR success. [310 CMR 50.42]

### A. MANAGEMENT POLICY

The Management Policy describes the way facilities encourage TUR and the policies affecting TUR.

**Important! You must review your Management Policy, and you must revise it if changes have occurred at your facility that would affect the Policy. [310 CMR 50.43 (1)]**

#### *Questions to Consider:*

- *Did the original Management Policy result in TUR at the facility?*
- *Did the original Management Policy result in employee involvement and participation?*
- *What changes can be made to the Management Policy to further encourage greater implementation of toxics use reduction at the facility? To encourage greater employee involvement?*
- *Since you wrote your Management Policy, have changes occurred in your facility that would affect the Policy.*
- *Has there been an implicit change in Management Policy since the Plan was crafted which should be noted as part of the update?*
- *Has the Management Policy taken shape and refined itself over the past two years? Does it need to be re-communicated as part of a refresher to the facility?*
- *Has the Management Policy been incorporated into, or coordinated with, your facility's business plan?*

(Example 3)

### **Sample Management Policy 2002**

We, the management of National Metal Devices are committed to manufacturing quality products with the absolute minimum use of toxic materials. Because a cleaner, safer environment is so important to everyone, especially our families, we will continue to be proactive in our pursuit of cost effective process changes that reduce or eliminate the use and/or generation of toxic materials. These objectives will be incorporated into the design of new products, the redesign of existing manufacturing processes, and into the construction of new facilities. We encourage all employees to forward their suggestions for helping to reduce our reliance on toxic chemicals to Bob Walker in the Engineering Department.

To support our facility's Management Policy, we will:

- Continue to develop manufacturing processes designed to eliminate or minimize pollution;
- Maintain compliance with all environmental regulations including OSHA, TURA, wastewater discharges, air permits and RCRA;
- Cooperate with government agencies to develop and comply with environmental regulations based on scientific standards; and
- Hold all National Metal Devices managers accountable for their area's environmental compliance records and their efforts towards achieving the facility's toxic use reduction goal.



(Example 4)

**Sample Management Policy 2004 (emphasis on materials accounting added)**

We, the management of National Metal Devices are committed to manufacturing quality products with the absolute minimum use of toxic materials. Because a cleaner, safer environment is so important to everyone, especially our families, we will continue to be proactive in our pursuit of cost effective process changes that reduce or eliminate the use and/or generation of toxic materials. These objectives will be incorporated into the design of new products, the redesign of existing manufacturing processes, and into the construction of new facilities. We encourage all employees to forward their suggestions for helping to reduce our reliance on toxic chemicals to Bob Walker in the Engineering Department.

To support our facility's Management Policy, we will:

- Continue to develop manufacturing processes designed to eliminate or minimize pollution;
- Maintain compliance with all environmental regulations including OSHA, TURA, wastewater discharges, air permits and RCRA;
- Cooperate with government agencies to develop and comply with environmental rules and regulations based on sound scientific standards;
- Hold all National Metal Devices managers accountable for their area's environmental compliance records and their efforts towards achieving the facility's toxic use reduction goal; and
- Perform materials accounting for every production process in order to minimize waste and keep production costs down.

**B. SCOPE OF PLAN**

The Scope of Plan section describes the production units and chemicals included in the Plan, the process for identifying TUR options, and the types of TUR techniques evaluated. It serves as an executive summary of the Plan.

**Important! The Scope of Plan must be updated to reflect any changes in production units or chemicals covered by the Plan. The Scope also must reflect any new processes for identifying TUR options or new TUR techniques. [310 CMR 50.43 (2) (a), (b), and (c)]**

***Questions to Consider:***

- *Did the statement of the Scope of Plan include a summary of the Plan Update, production units, and chemicals included in the Plan Update?*
- *Did the statement of the Scope of Plan include identified TUR options and an implementation schedule?*

**C. EMPLOYEE PARTICIPATION**

The facility is required to solicit ideas from employees on increasing the efficiency of chemical use and reducing the waste generated at the facility. At least six months before the deadline for submitting the Plan Summary, the facility is required to:

- Notify all of its employees of the requirements of the Plan Update;
- Identify the toxic chemicals and production units included in the Plan Update;
- Make available the regulations for the Plans; and
- Solicit comments and suggestions from employees on toxics use reduction options.

**Important! Completion of the Employee Notification for the 2004 Plan Update is required by January 1, 2004. If past years' employee notifications of TUR planning generated little interest or participation, facilities should consider a more aggressive, interactive approach. [310 CMR 50.42 (5)]**

***Questions to Consider:***

- *Was the method of employee notification effective and efficient at reaching all employees? Could this method be improved?*
- *Did the employee notification generate interest and participation?*
- *Were employees given feedback on their ideas? Have you considered rewards or recognition?*
- *Did you have active participation of employees at all levels of management and labor? How can broader participation be achieved?*
- *Have employees continued to identify TUR options and look for effective ways to implement TUR?*

(Example 5)

For the 2002 Plan Update, a facility posted the employee notification on all facility bulletin boards. This generated little participation. For the 2004 Plan Update the facility tried a different approach. It announced the employee notification at all staff meetings during the first week of January. Along with the announcement by the Group Manager, the Environmental Manager gave a five-minute overview of the benefits of toxic use reduction. The facility found that this new form of employee notification generated a greater interest, as employees felt that their supervisors appreciated their efforts.

#### **D. PROCESS CHARACTERIZATION**

Process characterization is performed for each production unit to accurately identify the steps and chemicals involved in manufacturing a product. Process and chemical flow diagrams are developed to aid in the definition of production units. Production units are the fundamental planning unit for tracking chemical use, byproduct generation, and chemical use efficiency. The process characterization section of the Plan includes:

- Defining the chemicals in the process (both inputs and outputs)
- Defining the production unit
- Creating a process flow diagram for each production unit
- Developing materials accounting information for each production unit
- Defining the unit of product

##### **D.1 Defining the Chemicals in the Process (both inputs and outputs)**

**Important! The original Plan must be revised if the purpose of the chemical in the production process has changed. [310 CMR 50.44(4)]**

### ***Questions to Consider:***

- *Is the process characterization you completed for the Plan still accurate? Have you implemented procedures to ensure that it stays up-to-date?*
- *Has the process for manufacturing the product changed during the past two years? If so, how: Chemical changes? Process changes? Equipment changes?*

### **Defining the Production Unit**

A production unit is a “process, line, method, activity, or technique or a combination or series thereof, used to produce a product (or family of products).” The manner in which a facility groups its processes into production units defines the depth of information available for analysis. Byproduct measurements in particular are usually more accurate when processes are split up into several production units rather than grouped into one.

**Important! If you have revised your production unit, your original Plan must be revised to reflect that change. [310 CMR 50.42(2)]**

### ***Questions to Consider:***

- *Does your production unit make sense to you? Is it effectively tracking your TUR progress?*
- *What changes need to be made to your production unit?*

### **D.2 Process Flow Diagram for each Production Unit**

Process flow diagrams are graphic sketches of a production unit, depicting all of the steps through which raw materials pass as they are transformed into products. These diagrams provide a clear picture of all stages of the production process, together with the raw materials and byproducts associated with each of these stages. A process flow diagram is required for every production unit and chemical combination.

**Important! If any production unit has been altered in a way that would affect the discovery and evaluation of new TUR options, the process flow diagram must be revised. Production unit alterations include changes in production units resulting from implementing TUR, and also new chemicals added to existing production units. [310 CMR 50.44(1)]**

### ***Questions to Consider:***

- *Is your Process Flow Diagram useful, accurate and up-to-date?*
- *What changes need to be made to the process flow diagram?*

### **D.3 Developing Materials Accounting Information for each Production Unit**

Materials accounting describes total inputs and outputs of the covered toxics in the production unit for the year on which the Plan Update is based. Input data includes the quantity of chemical used in the production unit. Output data describes quantities shipped in product, the losses as byproduct, the quantities treated onsite, and the quantities released or transferred offsite to the air, water, or POTWs, and as solid and hazardous wastes.

The materials accounting process serves as a basis for measuring the success of the TUR changes you have implemented. It is a method for determining the volume of toxic byproducts produced by your facility so that you can eventually measure how effectively those byproducts have been reduced. In addition, this process is used to track and allocate chemical use. Data on chemical use will help designate which areas of your process on which to focus TUR efforts.

**For the Plan Update, the total inputs and outputs of the covered toxics in the production unit for 2003 must be calculated. Input data includes chemicals used in the production unit. Output data describes the losses as byproduct, the quantities treated onsite, non-integral recycling, and the quantities released or transferred offsite to the air, water, or POTWs, and as solid and hazardous wastes. Materials accounting must be updated in order to reflect 2003 data, even if there are no other process characterization changes to be made. [310 CMR 50.43(3)]**

### ***Questions to Consider:***

- *Does your materials accounting system accurately track materials use and wastes?*
- *Is your materials accounting useful, accurate and up-to-date?*

### **D.4 Defining the Unit of Product**

The unit of product is a measure of the product outputs or the amount of work produced by a process. An accurate unit of product allows a facility to measure TUR progress while correcting for changes in business activity. In general, non-physical measures are less accurate than physical measures of production. The more closely the unit of product is related to chemical use, the more accurate the measure.

**Important! If you have revised your unit of product, your original Plan must be revised to reflect that change. [310 CMR 50.42(2)]**

### ***Questions to Consider:***

- *Does your unit of product make sense to you? Is it effectively tracking your TUR progress?*
- *What changes need to be made to your unit of product?*

The following examples of "best practice" for process characterization are derived from an EPA grant project that analyzed how industry has responded to TUR data collection requirements. Best practices are policies and procedures which facilities of all sizes and SIC codes are currently implementing. When employed, these practices produce data that most accurately reflect chemical use and byproduct generation.

#### ***Best Practice - Chemical Use Tracking***

##### **Diversified Metals Manufacturing Co. Uses "Just in Time" Inventory Control**

A diversified metals manufacturing facility uses a "Just in Time" inventory system and therefore carries little chemical inventory (no more than two weeks' supply at any time). As a result, each chemical is brought in specifically for each production unit and their production unit level tracking is very precise.

##### **Computerized MSDS System at a Flexible Web Coating Facility**

A flexible web coating facility has a computerized material safety data sheet (MSDS) system which is used to monitor the components of the coatings formulations used at the facility. This system helps to identify the reportable chemicals and monitor use for reporting and planning purposes, as well as satisfying certain record keeping requirements with DEP's air quality program.

##### **Using Wash Tickets to Track Clean-Up Solvents at a Flexible Web Coating Facility**

A flexible web coating facility generates batch tickets for both product formulations as well as equipment cleaning. While many facilities employ batch tickets for products, this firm uses wash tickets, enabling them to accurately track solvent use in an ancillary operation. This method gives them a wealth of production unit level data.

#### ***Best Practice - Choosing Production Units***

##### **Designing Production Units Based on Data Collection and Management Structure**

Best practice production unit definition is exemplified by a diversified metals manufacturing facility. The facility designated 42 production units using a team process involving plant-wide personnel, which was facilitated by the facility's environmental manager. The production units correspond with cost tracking, production control and management responsibility. However, these production units were designed to fit an existing data collection and management reporting structure and were not invented for the purposes of TUR. The facility's production control system tracks a surprisingly high level of materials accounting data in each of the 42 production units, producing reliable TUR progress data.

***Best Practice - Choosing Production Unit/Unit of Product Combinations***

**A Paper Manufacturing Facility Uses a Single Production Unit and Unit of Product**

A paper mill runs a single, continuous process that produces a single product. Thus, a single production unit is the most logical (and simplest) way to track progress for this facility. But generally when facilities designate greater numbers of production units, they retain the ability to track TUR progress more closely. More production units, however, translate into more data collection, such as production-level use, byproduct, unit of product and emissions tracking. Excessive numbers of production units with poor production unit level data may not benefit the facility as well as fewer production units with more accurate information would.

***Best Practice - Choosing a Unit of Product***

**A Flexible Web Coating Facility Chooses Unit of Product**

A flexible web coater uses "square yards coated" as a unit of product. Its coating machines have various capacities ranging from single to multiple coating heads. Depending on the product, the machine may coat one or both sides of the substrate. Rather than just using production numbers of "square yards coated," they have developed a database which tracks the number of times each square yard is coated and with which coating formulation. This database was originally developed for tracking VOC emissions, but provides excellent information for TUR purposes as well.

***Best Practice - Byproduct Tracking***

**A Diversified Metals Manufacturing Facility Cross-Checks Engineering Estimates**

A diversified metals manufacturing facility employs engineering factors to make estimates, but performs additional testing to adjust these factors. For example, the facility tests its acid baths to refine its understanding of the relationship between acid use, consumption and byproducts in its etching process. In another operation, the facility uses byproduct estimates for their plating chemicals, but cross checks these with RCRA waste data. This type of cross checking makes the estimate a more reliable basis for byproduct data.

**Iron/Steel Forging Uses Real Time Process Monitoring to Track Materials**

An iron/steel forging facility has a very accurate tracking system for acid use in an etching operation. The facility tests acid baths daily. Acid byproducts in the form of evaporation and carryover have been calculated and are considered constants. They then assume the amount of acid loss in the bath must be consumption. They know that typically 8-10% of the acid is generally consumed, therefore suspect results can be easily identified. This tracking procedure presents an accurate picture of acid use, consumption and byproducts.

**E. OPTIONS IDENTIFICATION, EVALUATION AND IMPLEMENTATION**

The Toxics Use Reduction Act requires that the Plan include for each covered toxic used in each production unit "a comprehensive economic and technical evaluation of appropriate technologies, procedures and training programs for potentially achieving toxics use reduction...." Facilities must generate all options that could potentially achieve toxics use reduction, determine which options are technically and economically feasible and develop an implementation schedule to track progress for those options chosen to be implemented. Facilities must evaluate the reductions in cost, chemical use, and byproduct generation achieved by the implementation of the TUR techniques.

Please note that TURA filers are not required to identify and quantify all costs associated with the use of all reportable toxics in all production units and to calculate total costs and costs per unit of product. Instead, filers are required to identify and quantify all direct and indirect costs that are relevant to the economic evaluation of feasible toxics use reduction options when they perform financial analyses of those options. Where no technically feasible options are available, filers must identify, but not necessarily quantify, the costs associated with using the toxic chemical. The methodology for capturing all such costs is described in the following section on Options Evaluation. Additionally, first time filers and/or new TUR Planners may find it beneficial to collect detailed cost information on all or most toxics and production units in order to fully understand the costs associated with the use of toxics in their facilities and to help prioritize TUR opportunities.

## E.1 OPTIONS IDENTIFICATION

**Important! You must identify the universe of TUR options available to your facility. Screen the universe to eliminate inappropriate options. [310 CMR 50.46]**

### ***Questions to Consider:***

- *Have you held a brainstorming session to generate new options? Have employees from all levels been involved?*
- *What options were originally proposed and why? Review your original list of possible TUR options. Reevaluate those options originally discarded as technically and economically infeasible.*
- *What new options are available now that were not available two years ago?*
- *Have you considered worker training programs/education as possible TUR options?*
- *Have any new technological advances occurred which would introduce the possibility of new options?*
- *Has your Management Policy or capital budgeting criteria for environmental projects changed to allow you to consider new options?*
- *The scope of your Plan outlines a procedure for identifying options. Have you exhausted all sources of information identified there? (Trade associations, journals, vendors, TURI, etc.)*



- *Have you considered implementing all six TUR techniques? (Input substitution, product reformulation, production unit redesign/modification, production unit modernization, improved operations and maintenance, in-process recycling)*

TUR techniques that were not practical two years ago now may be feasible. When you have developed the new or revised list of TUR techniques, you then need to proceed with the rest of the TUR technique evaluation. Please keep in mind that TUR techniques need only be evaluated in a way "sufficient to be able to make a good business decision."

***Best Practice - Eliminates Hydrochloric and Nitric Acid Through Process of Options Identification***

This job shop manufactures closed die forgings and investment castings from steel parts for facilities in the petrochemical, aircraft, medical and commercial markets. The facility eliminated the use of acids in preparing parts for inspection and saved nearly \$47,000 in the first year after making process changes discovered through the TUR planning process.

Prior to TUR planning, the forging unit used an acid passivation operation for in-process inspection of parts. The process of identifying options to remove metals from rinse waters led to consideration of alternatives to the acid process. The result was a process change to the use of a tumblast abrasive cleaning machine which, using a mixture of grit and glass shot, provides a surface finish suitable for inspection. The \$47,000 savings consisted of a conservative estimate of the value of avoided treatment costs as well as the reduction of hydrochloric and nitric acid use by 100%.

***Best Practice - Eliminates TCE Cleaning***

This facility previously used TCE to clean oil off parts supplied from a foreign source. They had identified alternative cleaners in their 1998 Plan, but had not found one that cleaned the parts well enough. As part of the 2000 Plan Update they identified purchasing parts that were not packed in oil as an option. They then found a local supplier, which could directly supply the parts eliminating the need for oil. The parts were slightly more expensive per piece from the new supplier but when the facility factored in the costs associated with TCE cleaning (raw materials, labor, production time, waste disposal) and the transportation costs, the facility found that they actually saved money and reduced lead time by using the local parts.

## **E.2 TECHNICAL EVALUATION**

**Important! You must reevaluate the technical feasibility of the options which you previously considered and rejected, and identify any new options to be evaluated. [310 CMR 50.46(5)]**

### ***Questions to Consider:***

- *Have the criteria that you originally used to evaluate the options changed?*
- *Has an alternative you originally considered and rejected become technologically feasible through advancements in the technology?*
- *Have you performed a thorough technical assessment for each option?*
- *Have you made changes to the process that would allow reconsideration of options originally discarded?*
- *When comparing current use and equipment investments that have previously been made to potential alternatives that would require new investments in equipment, have you considered the useful life of the equipment currently in use?*
- *What projects have been implemented that were not on the original implementation lists? Why were these projects given priority over others?*
- *Did an option impact another environmental reporting/permitting requirement?*

#### ***Best Practice- Metal Finisher Switches to Water-Based Paint***

A metal finisher once used solvent-based paints to coat metal parts. The facility identified water-based paints as an alternative in its 1994 Plan. The option was not chosen for implementation in 1994 after testing showed that the water-based paints did not give a glossy finish. Water-based paints were reevaluated in the 1996 Plan Update and testing showed that the new improved water-based paints gave an excellent quality glossy finish when dried in a drying oven. An economic evaluation then determined that switching to water-based paints was not economically feasible if a drying oven had to be purchased. Water-based paints were evaluated for a fourth time in the 2000 Plan Update. The reevaluation showed that a switch to water-based paints combined with the addition of a drying oven would improve throughput enough so that the oven would pay for itself in six months. The facility's persistence in reevaluating water-based paints as they became more technologically advanced allowed the facility to eliminate the use of 50,000 pounds of solvent-based paints per year. As a result, the facility was no longer required to have an air permit and eliminated the need to report under TURA and TRI.

### **E.3 ECONOMIC EVALUATION**

**Important! You must evaluate the economic feasibility of the technically feasible options that you identified. [310 CMR 50.46(6)]**

In the Plan Update it only is necessary to identify the **incremental** costs of TUR options, i.e., costs of the existing process that will be avoided and those new costs, including both initial and operating costs that will be incurred.

Many indirect costs associated with the use of toxics are lumped into overhead accounts and are not accurately allocated to the products or processes that generate them. Often these costs are charged to the budget of the division handling environmental duties. Financial analyses may fail to capture these “hidden” costs and thus will tend to underestimate the economic savings of TUR initiatives.

The first step in the identification and calculation of incremental costs is to determine what cost generators (activities, materials, equipment) change between the existing and the modified process. Process flow diagrams can help to clarify both where costs are generated and how they will change with the implementation of a TUR project. Table 2 on page 27 provides a detailed inventory of possible costs to consider.

The next step is to attach dollar values to those incremental cost items. Because much of the cost information will not be available from a facility's financial and cost accounting systems, it will be necessary to go to *primary sources* and collect *raw data* to form a full cost picture. Often this work requires an estimate of the amount of time an employee spends on a particular activity (such as manifesting) or the amount of a resource that is consumed in the production process (such as the electricity used by a piece of equipment). Although such estimates often lack precision, if they are made by the people who actually perform the work or who are knowledgeable about a process, the information should be sufficiently accurate. Table 1 shows sources of cost information.

(Table 1) Sources of Cost Information	
<p><b>Primary Sources</b></p> <p><b>Interviews</b> with operational and environmental staff.</p> <p><b>Records</b> from purchasing, payroll, accounting.</p> <p><b>Logs</b> of activities or material use.</p> <p><b>Receipts</b> and <b>Invoices</b> from suppliers and vendors.</p> <p><b>Vendors</b> of new equipment and industry price trends.</p> <p><b>Measurements</b> of times, volumes, flow rates.</p>	<p><b>Types of Raw Data</b></p> <p><b>Time:</b> Actual hours, percentages.</p> <p><b>Labor Costs:</b> Total compensation rate.</p> <p><b>Materials:</b> Actual quantities, percentages.</p> <p><b>Fees:</b> Per toxic substance, facility charge percentage.</p> <p><b>External Costs:</b> Maintenance, waste disposal.</p> <p><b>General:</b> Percentage of insurance, utilities.</p>

As part of the economic evaluation, facilities also should consider the qualitative or less tangible benefits of a toxics use reduction investment. Often TUR projects generate gains that may be difficult to quantify but that can significantly enhance a facility's ability to compete. Examples of such benefits include:

- reduced liability
- worker health and safety
- customer satisfaction
- public image
- green marketing
- regulatory compliance

***Questions to Consider:***

- *Have the raw material or disposal costs of the toxic increased since the last Plan or Plan Update?*
- *Have the costs of an alternative decreased since the last Plan or Plan Update?*

In performing your economic evaluations of TUR options, have you:

- identified the incremental costs and savings that are relevant to the financial analysis?
- examined the following items to see if they are incremental costs and savings, and included an accurate measure or estimate if they are?
  - ◊ your **direct costs**
  - ◊ your **indirect costs**, including: storage, accumulation, treatment, disposal, handling, compliance, health and safety, insurance
  - ◊ potential liability costs and other qualitative costs
  - ◊ all costs of implementing the TUR option
  - ◊ salvage value of currently used equipment that will become unnecessary
- used the same profitability measures and approval thresholds that your facility uses for other capital improvements?

***Best Practice - Miscellaneous Metal Parts Coater - Switches to Alternative Coating***

This facility had identified two technologically feasible alternative coatings in its 2000 Plan. However, neither coating was economically feasible due to their high raw materials costs. The facility reevaluated the coatings for their 2002 Plan Update and found that the raw materials price of one alternative had dropped substantially. The facility was able to eliminate its VOC use due to this reevaluation.

***Best Practice - Coatings Manufacturer - Eliminates costly coating color***

This facility decided it would be worthwhile to reevaluate the cost of using a toxic in its multiple product lines. They identified the hazardous waste costs as the biggest contributing factor and decided to evaluate them further. The facility found that one particular shade of coating contributed more than twice as much as the other shades to their hazardous waste volume. Further evaluation showed that they were actually taking a loss on that particular shade. The facility decided to discontinue the shade and was able to reduce their use and disposal of toxics as well as improve their profitability.

**(Table 2) Examples of Environmental Costs**

<u><b>Regulatory</b></u>	<u><b>Upfront</b></u>	<u><b>Voluntary (Beyond Compliance)</b></u>
<ul style="list-style-type: none"> <li>• Notification</li> <li>• Reporting</li> <li>• Monitoring/testing</li> <li>• Studies/modeling</li> <li>• Remediation</li> <li>• Record keeping</li> <li>• Plans</li> <li>• Training</li> <li>• Inspections</li> <li>• Manifesting</li> <li>• Labeling</li> <li>• Permitting</li> <li>• Preparedness</li> <li>• Protective equipment</li> <li>• Medical surveillance</li> <li>• Environmental insurance</li> <li>• Financial assurance</li> <li>• Pollution control equipment</li> <li>• Maintenance</li> <li>• Repair</li> <li>• Spill Response</li> <li>• Stormwater management</li> <li>• Waste management</li> <li>• Taxes/fees</li> </ul>	<ul style="list-style-type: none"> <li>• Site studies</li> <li>• Site preparation</li> <li>• Permitting</li> <li>• R &amp; D</li> <li>• Engineering</li> <li>• Procurement</li> <li>• Installation</li> </ul> <p align="center"><u><b>Back End</b></u></p> <ul style="list-style-type: none"> <li>• Closure/de-commissioning</li> <li>• Disposal of inventory</li> <li>• Post-closure care</li> <li>• Site survey</li> </ul> <p align="center"><u><b>Conventional Costs</b></u></p> <ul style="list-style-type: none"> <li>• Capital equipment</li> <li>• Materials</li> <li>• Labor</li> <li>• Supplies</li> <li>• Utilities</li> <li>• Structures</li> <li>• Salvage value</li> </ul>	<ul style="list-style-type: none"> <li>• Community outreach</li> <li>• Monitoring/testing</li> <li>• Training</li> <li>• Audits</li> <li>• Qualifying suppliers</li> <li>• Environmental reports</li> <li>• Insurance</li> <li>• Planning</li> <li>• Feasibility studies</li> <li>• Remediation</li> <li>• Recycling</li> <li>• Environmental studies</li> <li>• R &amp; D</li> <li>• Habitat protection</li> <li>• Landscaping</li> <li>• Environmental projects</li> <li>• Financial support of NGOs</li> </ul>
<u><b>Contingent Costs</b></u>		
<ul style="list-style-type: none"> <li>• Future compliance costs</li> <li>• Penalties/fines</li> <li>• Response to future releases</li> </ul>	<ul style="list-style-type: none"> <li>• Remediation</li> <li>• Property damage</li> <li>• Personal injury damage</li> </ul>	<ul style="list-style-type: none"> <li>• Legal expenses</li> <li>• Natural resource damage</li> <li>• Economic loss damages</li> </ul>
<u><b>Image / Relationship Costs</b></u>		
<ul style="list-style-type: none"> <li>• Corporate image</li> <li>• Relationship with customers</li> <li>• Relationship with investors</li> <li>• Relationship with insurers</li> </ul>	<ul style="list-style-type: none"> <li>• Relationship with professional staff</li> <li>• Relationship with workers</li> <li>• Relationship with suppliers</li> </ul>	<ul style="list-style-type: none"> <li>• Relationship with lenders</li> <li>• Relationship with communities</li> <li>• Relationship with regulators</li> </ul>

This list is adapted from EPA's publication: *An Introduction to Environmental Accounting As a Business Tool: Key Concepts and Terms*

#### E.4 OPTIONS IMPLEMENTATION

**Important! You must develop an implementation schedule for those options you have chosen to implement. If your original Plan included an implementation schedule for TUR techniques, you must indicate whether or not you implemented the TUR techniques and whether you met the schedule in the Plan. If you were unable to implement the techniques or did not meet the schedule, include an explanation as to why you were unable to do so in the Plan Update. [310 CMR 50.46(6)(7)]**

##### ***Questions to Consider:***

- *Exactly how many pounds of byproduct were avoided? How far-reaching were the changes you made? Did the changes impact other operations in the facility?*
- *Have the TUR projects which were implemented saved your facility money, and if so, for how long?*
- *Have the TUR projects implemented cost your facility money? How much?*
- *Have you prioritized the projects as short - and long-term for two - and five-year Planning?*
- *Have you developed an implementation schedule for each option? Have the projects been completed on time? (See example 6, Implementation Schedule on page 30)*
- *What barriers to project implementation have you encountered?*

##### ***Best Practice- Northrup Grumman Corporation - Process Redesign Yields Gains in Chemical Use Efficiency***

- This manufacturer designed an innovative precision cleaning system that achieved order-of-magnitude reductions in emission losses. The new system served as the cornerstone of the company's program to eliminate ozone-depleting chemicals.
- Solvent vapor degreasers were modified to reduce emission losses through the installation of sub-zero freeboard cooling and automatic lifts to reduce dragout.
- Epoxy stripping operations were re-engineered by substituting a less hazardous chemical for certain substrates.
- Through improved process control, the company extended the life of metal cleaning baths, thereby reducing the need to change and dispose these baths as frequently.
- In recognition of these efforts, Northrup Grumman received a Toxics Use Reduction Governor's Award.

##### ***Best Practice - Adhesive Coater - Team Building/Process Analysis***

The "Solvent Use Reduction Team" at this adhesive coating facility was formed as a result of the TUR planning

process to evaluate the use of toluene. The team solicited ideas from machine operators and supervisors from all shifts. Careful evaluation of work practices was performed. The standard procedure had been to add five gallons of toluene to each thin drum of adhesive before application to the substrate. Tests were run on the coating machine and the team discovered that the machine ran well and the product was unaffected when just three gallons of toluene were added to each drum of adhesive. This simple project reduced toluene use by 1,000 gallons per year.

## E.5 IMPLEMENTATION SCHEDULE

**Important! An implementation schedule is required as part of your Plan and is useful for tracking TUR projects. [310 CMR 50.46(6)(d)]**

These schedules are useful for tracking the various TUR projects that Planners are working on. It may be helpful to list options chosen for implementation into two categories: 2 years and 5 years, in order to track completion dates.

### ***Best Practice - Implementation Scheduling***

#### **Implementation Scheduling of a Paint Manufacturing Facility**

A paint manufacturing facility created written schedules for tracking each of the various TUR projects underway. Recording a schedule on paper helped staff to see each TUR effort as a concrete, workable discrete project for which there was a completion date. The following is an example of a schedule for their Ethylene Glycol substitution project. See example 6.

(Example 6)

***Implementation Schedule for Ethylene Glycol Substitute***

Project Name	Description	Testing and Implementation Steps	Dates	On Schedule?	Comments
Substitute Ethylene Glycol	Replace EG with propylene glycol in all water-based products	prepare test runs	7/98	y	
		verify freeze/thaw results	8/98	y	
		verify quality metrics	9/98	y	
		change formulas in computer	2/99	4/99	Difficulty changing formulas in system delayed project
		train workers	3/99	5/99	
		project complete	5/99	7/99	

***Best Practice - Hampden Papers - Vendor and Facility Partnership***

*"The innovation for the aqueous-based coatings came from a joint effort of supplier facilities opening their laboratories to each other.... The avoidance of expenditures on VOC controls has helped Hampden save several million dollars and be able to afford investments in high-quality production equipment."*

*1994 Toxics Use Reduction Governor's Award Winner.*

**F. PLAN SUMMARY FORM AND CERTIFICATION STATEMENT**

Facilities do not need to submit the complete Plan Update to DEP, but are required to submit a Plan Summary **by July 1, 2004**, which includes three forms:

- Exceptions to Plan Requirements,
- Plan Summary Form, and
- Plan Certification Statement signed by a DEP-certified TUR Planner and a Senior Management Official.

Please refer to Appendix A for these Forms with instructions.

**Important! You must submit your Plan Summary to DEP by July 1, 2004, along with your 2003 toxics use report.**



## Appendix A

### PLAN SUMMARY FORMS AND INSTRUCTIONS

#### I. EXCEPTIONS TO PLAN REQUIREMENTS

A facility is exempt from completing a 2004 Plan Update for a chemical if the facility:

- **has eliminated the chemical or reduced the chemical use below its reporting threshold (and will not exceed the reporting threshold in 2004); or**
- **has closed or expects to close in 2004.**

Facilities may have exceptions for some but not all chemicals. In that case, the facility should complete a Plan Update for those chemicals where there is no exception to plan requirements.

If your facility has eliminated or reduced **ALL** chemical use to below reporting thresholds, or has closed or expects to close in 2004, please send the Exceptions to Plan Requirements Form to DEP by July 1, 2004.

**Please note that Exceptions to Plan Requirements do not apply to reporting. If a facility exceeded the reporting threshold for a chemical in 2003, the facility must file a toxics use report by July 1, 2004 and pay the toxics use fee for that chemical.**

#### FORM KEY:

**Planning Year.** *The planning year is 2004 for Plan Summaries due July 1, 2004. Electronic filing will automatically complete this field.*

**Facility Name.** *As indicated on your Form S and Form R. Electronic filing will automatically complete this field.*

**Facility ID Number.** *Your DEP Facility Number as indicated on the mailing label of DEP.*

*This is the number you should have indicated on your Form S. Electronic filing will automatically complete this field.*

1. **This facility has no exceptions to planning requirements.** *Facilities that do not meet the conditions of #'s 2, 3 or 4 of the Exceptions to Plan Requirements do not need to complete this form on paper, if filing electronically ☒ this box and continue as directed to the Plan Summary form.*
2. **This facility has eliminated, or reduced below threshold, the chemicals indicated in #3.** *Facilities that eliminated a TURA reportable chemical or reduced below TURA reportable thresholds should indicate with a ☒ here, and continue to Section 3.*
3. **Indicate CAS# Chemical Name, Method and Steps taken.** *For those chemicals that meet the qualifications of #2 above, please complete the information as noted below.*

**3.\_.1 CAS#.** *Indicate the Chemical Abstract Service Identification number here; please note that DEP does not use the EPA Chemical Category 'N' numbers, but uses a 4-digit numeric identification found in the Form S reporting guidance, Appendix B.*

**3.\_.2 Chemical Name.** *Paper filers indicate the name of the chemical that corresponds with the CAS number here. Electronic filing will automatically complete this field.*

**Method ☐ E** *If the chemical use has been completely eliminated, please indicate with a ☒*

**Method ☐ R** *If the chemical use has been reduced below reporting thresholds, please indicate with a ☒*

**3.\_4 By taking the following steps.** *Indicate in text the steps that you have taken to accomplish the elimination or reduction of the chemical use.*

**p. Do you have additional chemicals to list?** ☐ **yes** ☐ **no** *If filing on paper, please complete this with a ☒ and attach an additional sheet (copy) if necessary. If filing electronically, please ☒ the appropriate box and, if necessary, continue to add additional chemicals that are eliminated or reduced below threshold.*

**4. The facility is scheduled to close.** *If the facility is scheduled to close in 2004, please ☒ the box and indicate the month, day, and year (2004 only) in mm/dd/yyyy format.*

**5. I am aware that there are penalties for submitting false information, including possible fines.** *The signature of the Sr. Management Official, printed Sr. Official's name, date signed and e-mail address of the Sr. Management Official should be indicated here. The TUR Planner may sign here only if s/he is the Sr. Management Official as well as the Certified TUR Planner. Electronic filing of this information will automatically complete this information based on the input in the Form S Cover Sheet.*



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Bureau of Waste Prevention

# Exceptions to Plan Requirements

Planning Year \_\_\_\_\_

Facility Name \_\_\_\_\_

DEP Facility ID Number \_\_\_\_\_

I certify under penalty of law that to the best of my knowledge and belief the following is true:

**Important:**

When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



\*Method:  
E = Eliminate  
R = Reduce below reporting threshold

- ☐ This facility has no exceptions to planning requirements - skip to Plan Summary form.
- ☐ This facility has eliminated, or reduced below reporting threshold, the chemicals indicated in #3.
- Indicate CAS#, Chemical Name, Method, and Steps taken:

CAS#	Chemical Name	Method*	By taking the following steps:
3.a.1	3.a.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.a.4
3.b.1	3.b.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.b.4
3.c.1	3.c.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.c.4
3.d.1	3.d.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.d.4
3.e.1	3.e.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.e.4
3.f.1	3.f.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.f.4
3.g.1	3.g.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.g.4
3.h.1	3.h.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.h.4
3.i.1	3.i.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.i.4
3.j.1	3.j.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.j.4
3.k.1	3.k.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.k.4
3.l.1	3.l.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.l.4
3.m.1	3.m.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.m.4
3.n.1	3.n.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.n.4
3.o.1	3.o.2	E R <input type="checkbox"/> <input type="checkbox"/>	3.o.4

- p. Do you have additional chemicals to list? Yes ☐ No ☐  
If filing on paper, please attach an additional sheet to continue.

4. ☐ This facility is scheduled to close on: \_\_\_\_\_  
Date (mm/dd/yyyy)

5. I am aware that there are penalties for submitting false information, including possible fines.

a. Signature of Senior Management Official \_\_\_\_\_

b. Date (mm/dd/yyyy) \_\_\_\_\_

c. Print Name of Senior Management Official \_\_\_\_\_

d. E-Mail Address \_\_\_\_\_

## II. PLAN SUMMARY FORM

A Plan Summary Form must be completed and submitted to DEP for **EACH** chemical for which you file a Form S for 2003 (due July 1, 2004). If you will no longer report on a chemical that you planned for in the past, you do not need to complete a Plan Summary Form for that chemical; however, you should submit the Exceptions to Plan Requirements form for that chemical. You also may choose to provide DEP with information regarding your success in reducing the use of the chemical in the narrative section of the Plan Summary Form, Section C.

### FORM KEY:

**Planning Year.** *The planning year is 2004 for Plan Summaries due July 1, 2004. Electronic filing will automatically complete this field.*

**Facility Name.** *As indicated on your Form S and Form R. Electronic filing will automatically complete this field.*

**Facility ID Number.** *Your DEP Facility Number as indicated on the mailing label of DEP. This is the number you should have indicated on your Form S. Electronic filing will automatically complete this field.*

### Section A. Facility-Wide Data

1. **Chemical Name.** *Paper filers should indicate the name of the chemical that corresponds with the CAS number here. Electronic filing will automatically complete this field.*
2. **CAS#.** *Indicate the Chemical Abstract Service Identification number here; please note that DEP does not use the EPA Chemical Category 'N' numbers, but uses a 4-digit numeric identification found in the Form S reporting guidance, Appendix B*

**Projected Changes in Use from 2003.** *Fields 3 and 4 record the projected increases or decreases in the quantities of toxic chemicals used on a facility-wide basis. The amount that should be entered is the **difference** between the amount of the chemical **expected** to be used in the **future** and the amount **actually** used in 2003.*

3. **Use.** *Indicate the expected difference in **USE** between **2005** and **2003**.*
4. **Use.** *Indicate the expected difference in **USE** between **2008** and **2003**.*

**Projected Changes in Byproduct from 2003.** *Fields 5 and 6 record the projected increases or decreases in the quantities of toxic chemicals generated as byproducts on a facility-wide basis. The amount that should be entered is the **difference** between the amount of the chemical **expected** to be generated as byproduct in the **future** and the amount **actually** used or generated in 2003.*

5. **Byproduct.** *Indicate the expected difference in **BYPRODUCT** between **2005** and **2003**.*
6. **Byproduct.** *Indicate the expected difference in **BYPRODUCT** between **2008** and **2003**.*

7. **Is this chemical used only in wastewater treatment?**  
☐ yes – skip to Section C  
☐ no – go to Section B

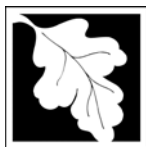
If the facility uses the chemical **ONLY** to treat wastewater, and for no other reportable reason, the production unit level data is not needed (waste water treatment is not a production unit). If this is the case, please complete additional Plan Summary Forms as needed, and be sure to complete the filing with the Plan Certification Form.

### Section B. Production Unit Level Data

- 1a – 6a **Production Unit.** *Enter only the production units reported on 2003 Form S Cover Sheet*  
1b - 6b **Two Year Projected BRI from Base Year.** *This is a numeric field.*  
1c – 6c **Five Year Projected BRI from Base Year.** *This is a numeric field.*  
1d – 6d **TUR Technique Code.** *This is a numeric code from the matrix in the Form S package.*

### **Section C. Additional Information**

This section allows you to provide additional information about your facility's TUR Plan and/or progress. Some facilities may choose to describe accomplishments, quantify savings, or provide additional information about improvements to workplace safety as a result of their TUR activities. This space can be used to explain why 2001 projections in chemical use and byproduct generation were not met. It is intended that facilities will use this opportunity to communicate their progress to DEP and the public.



Massachusetts Department of Environmental Protection  
Bureau of Waste Prevention

# Plan Summary

\_\_\_\_\_  
Planning Year

\_\_\_\_\_  
Facility Name

\_\_\_\_\_  
DEP Facility ID Number

**A separate form for each covered toxic is required**

## A. Facility-Wide Data

**Important:**

When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



\_\_\_\_\_  
1. Chemical Name

\_\_\_\_\_  
2. CAS #

Changes from prior plan (Total lbs.):

Two Year

Five Year

Use

\_\_\_\_\_  
3. Use

\_\_\_\_\_  
4. Use

Byproduct

\_\_\_\_\_  
5. Byproduct

\_\_\_\_\_  
6. Byproduct

7. Is this chemical used only in wastewater treatment? ☐ Yes – skip to Section C.  
☐ No – go to Section B.

## B. Production Unit Level Data

Production Unit	Two Year Projected BRI From Base Year	Five Year Projected BRI From Base Year	TUR Technique Code(s)							
_____ 1a	_____ 1b	_____ 1c	_____ 1d	_____ 1e	_____ 1f	_____ 1g	_____ 1h	_____ 1i	_____ 1j	
_____ 2a	_____ 2b	_____ 2c	_____ 2d	_____ 2e	_____ 2f	_____ 2g	_____ 2h	_____ 2i	_____ 2j	
_____ 3a	_____ 3b	_____ 3c	_____ 3d	_____ 3e	_____ 3f	_____ 3g	_____ 3h	_____ 3i	_____ 3j	
_____ 4a	_____ 4b	_____ 4c	_____ 4d	_____ 4e	_____ 4f	_____ 4g	_____ 4h	_____ 4i	_____ 4j	
_____ 5a	_____ 5b	_____ 5c	_____ 5d	_____ 5e	_____ 5f	_____ 5g	_____ 5h	_____ 5i	_____ 5j	
_____ 6a	_____ 6b	_____ 6c	_____ 6d	_____ 6e	_____ 6f	_____ 6g	_____ 6h	_____ 6i	_____ 6j	

Section C is optional.

## C. Additional Information

You may use the following section to provide more information about your TUR Plans and/or progress.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## **Section A – Additional Guidance**

### **Example for Completing Section A**

2003 lbs. used: 100,000 (from your Form S)  
2005 estimate, lbs. used: 110,000  
2008 estimate, lbs. used: 95,000  
Two Year Use Projection: 10,000 lbs. (enter Field 3)  
Five Year Use Projection: -5,000 lbs. (enter Field 4)

2003 lbs. byproduct: 3,800 (from your Form S)  
2005 estimate, lbs. byproduct: 3,200  
2008 estimate, lbs. byproduct: 1,000  
Two Year Projected Byproduct: -600 lbs. (enter Field 5)  
Five Year Projected Byproduct: -2,800 lbs. (enter Field 6)

#### **PLEASE NOTE:**

- IF you expect **USE** or **BYPRODUCT** to **decline** in the future, the number of pounds entered in the Two and Five Year Projections should be **NEGATIVE**. (Please use a minus sign to indicate negative numbers. Do not use parentheses.)
- IF you expect **USE** or **BYPRODUCT** to **increase** in the future the number of pounds entered in the Two and Five Year Projections should be **POSITIVE**.

#### **Mistakes to Avoid:**

- Do not leave the fields blank. Fields 3-6 must be filled in, and filled in with a number expressed in pounds. If you do not expect any change, enter zero. "N.A." is not an appropriate entry.
- Do not enter totals for expected use and/or byproduct for years 2005 and 2008. Enter the expected **change** in use and byproduct between 2003 and the listed year.

## **Section B – Additional Guidance**

The Production Unit Level Data section describes the projected BRIs for each production unit in which the chemical is used and the TUR technique used. The TUR Plan must contain separate BRI projections for **each production unit** for the years 2005 and 2008. The BRIs entered should be supported by information contained in your TUR Plan Update.

**1a-6a Production Unit.** Enter the **Production Unit Number** from the 2003 Form S Cover Sheet. Each production unit in which the chemical is used at the facility should be entered on a separate line. A total of six production units can be included on the Plan Summary Form. (If you have more than six production units associated with a chemical, electronic reporting will prompt you to add an additional form if necessary. If you are filing a paper copy, continue them on another blank Plan Summary Form.)

**1b-6b Two Year Projected BRI from Base Year.** Enter the projected BRI in 2005 calculated using the base year reported on your Form S.

**1c-6c Five Year Projected BRI from Base Year.** Enter the projected BRI in 2008 calculated using the base year reported on your Form S.

The Byproduct Reduction Index is calculated as follows:

$$\text{BRI} = 100 \times \frac{\text{A}-\text{B}}{\text{A}}$$

A = Byproduct quantity in the base year  
unit of product in the base year

B = Byproduct quantity in the reporting year  
unit of product in the reporting year

Please see additional instructions on how to calculate the BRI in the **2002 Toxics Use Reporting Forms and Instructions**, "Guide to Completing the Form S."

**PLEASE NOTE:**

- If your TUR Plan Update indicates that you will be implementing additional TUR techniques between 2003 and 2005 and/or 2008, the BRI should **INCREASE** from the number shown on the 2003 Form S.
- A negative BRI means that the facility expects to generate MORE byproduct per unit of product in the projected year than it did in the BASE YEAR.
- If your TUR Plan indicates that you plan to implement additional TUR methods between 2005 and 2008, then the BRI entered for 2008 should be greater than the BRI entered in 5. for 2005.
- If you are **ELIMINATING** a chemical, then the BRI should be **100**.

**Mistakes to Avoid:**

- Do not leave these fields blank. If you do not expect the BRI to change in the future, then ENTER THE BRI THAT IS ON YOUR 2003 FORM S for that production unit/chemical combination.
- Do not calculate one BRI for all production units. BRI projections must be calculated for EACH production unit in which the chemical is used.

**1d-6d TUR Technique Code.**

The purpose of the TUR Technique Code field is to record the codes for the TUR techniques the facility plans to implement between 2003 and 2008, which will result in the projected 2008 BRI. These codes are found in the **Toxics Use Reduction Techniques Matrix**, which is on the last page of the **Form S**. If your facility plans to implement techniques for a production unit/chemical combination that will increase the BRI by **5 points or more**, this field must be filled in. Leave this field blank **ONLY** if you plan on implementing no TUR or the BRI is projected to change by either less than 5 points or to be negative.



### III. PLAN CERTIFICATION STATEMENT

**Planning Year.** *The planning year is 2004 for Plan Summaries due July 1, 2004. Electronic filing will automatically complete this field.*

**Facility Name.** *As indicated on your Form S and Form R. Electronic filing will automatically complete this field.*

**Facility ID Number.** *Your DEP Facility Number as indicated on the mailing label of DEP. This is the number you should have indicated on your Form S. Electronic filing will automatically complete this field.*

#### **Section A - Planner Certification**

- 1 **Signature of Toxics Use Reduction Planner.** *Only a Certified Toxics Use Reduction Planner may sign this statement. Electronic filers will enter their last name, followed by their first name.*
- 2 **Date.** *Date the TUR Planner is certifying that the plan meets the requirements of 310 MCR 50.40. Electronic filers enter in month, day, year.*
- 3 **Print Name of TUR Planner.** *Please print the Planner name. Electronic filings will automatically complete this line.*
- 4 **Email Address.** *Please enter in the Planner email address (if available).*
- 5 **TUR Planner I.D. Number.** *Please enter the TUR Planner ID number (from the planner certification letter or certificate received from DEP. Electronic filers will be prompted to enter this field first, then to enter field #1).*

#### **Section B - Senior Management Official Certification**

- 1 **Signature of Senior Management Official.** *The same official that signs the Form S Cover Sheet should sign here. Electronic filing will automatically fill this field.*
- 2 **Date.** *Date that the Senior Management Official signs the form. Electronic filing will automatically fill this field.*
- 3 **Print name of Senior Management Official.** *Please print the name of the Senior Management Official. Electronic filing will automatically fill this field.*
- 4 **Email address.** *Please provide the email address of the Senior Management Official. Electronic filing will automatically fill this field.*



# Plan Certification Statement

\_\_\_\_\_  
Planning Year

\_\_\_\_\_  
Facility Name

\_\_\_\_\_  
DEP Facility ID Number

## A. Planner Certification

Based on my independent professional judgment as a Toxics Use Reduction Planner, I certify under penalty of law that the following is true:

**Important:**

When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



- (a) I have examined and am familiar with this Toxics Use Reduction Plan;
- (b) the Plan satisfies the requirements of 310 CMR 50.40; and
- (c) the Plan demonstrates a good faith and reasonable effort to identify and evaluate toxics use reduction options.

\_\_\_\_\_  
1. Signature of Toxics Use Reduction Planner

\_\_\_\_\_  
2. Date (mm/dd/yyyy)

\_\_\_\_\_  
3. Print Name of Toxics Use Reduction Planner

\_\_\_\_\_  
4. E-Mail Address

\_\_\_\_\_  
5. TUR Planner I.D. Number

## B. Senior Management Official Certification

I certify under penalty of law that the following is true:

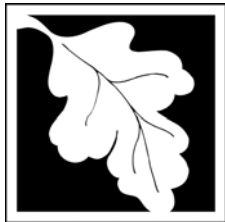
- (a) I have personally examined and am familiar with this Toxics Use Reduction Plan;
- (b) I am satisfied that any supporting documentation used in the development of the Plan exists and is consistent with the Plan;
- (c) based on my inquiry of those individuals immediately responsible for the development of this Plan, I believe that the information in the Plan and any supporting documentation used in the development of the Plan is true, accurate, and complete;
- (d) the Plan, to the best of my knowledge and belief, meets the requirements of 310 CMR 50.40; and
- (e) I am aware that there are penalties for submitting false information, including possible fines and imprisonment.

\_\_\_\_\_  
1. Signature of Senior Management Official

\_\_\_\_\_  
2. Date (mm/dd/yyyy)

\_\_\_\_\_  
3. Print Name of Senior Management Official

\_\_\_\_\_  
4. E-Mail Address



Massachusetts Department of  
Environmental Protection  
One Winter Street  
Boston, MA 02108-4746

Commonwealth of Massachusetts  
Mitt Romney, Governor

Executive Office of Environmental Affairs  
Ellen Roy Herzfelder, Secretary

Department of Environmental Protection  
Robert W. Gollledge, Jr., Commissioner